

Derwent WPI

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**Service quality estimation method for channels of digital transmission system - determining service quality on transmission channels from variance of soft decision output signals provided by turbo-decoder at receiver side**

Patent Assignee: SIEMENS AG (SIEI)

Inventor: BERENS F; BERENS T; DOETSCH M; JUNG P; PLECHINGER J

Patent Family ( 11 patents, 33 & countries )

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
DE 19736653	C1	19981210	DE 19736653	A	19970822	199902	B
WO 1999011013	A1	19990304	WO 1998DE2172	A	19980729	199916	E
AU 199892534	A	19990316	AU 199892534	A	19980729	199930	E
EP 1005735	A1	20000607	EP 1998945070	A	19980729	200032	E
			WO 1998DE2172	A	19980729		
BR 199811918	A	20000815	BR 199811918	A	19980729	200045	E
			WO 1998DE2172	A	19980729		
CN 1268268	A	20000927	CN 1998808414	A	19980729	200067	E
KR 2001023205	A	20010326	KR 2000701834	A	20000222	200161	E
JP 2001514459	W	20010911	WO 1998DE2172	A	19980729	200167	E
			JP 2000508160	A	19980729		
RU 2202153	C2	20030410	WO 1998DE2172	A	19980729	200338	E
			RU 2000107150	A	19980729		
US 6629286	B1	20030930	WO 1998DE2172	A	19980729	200367	E
			US 2000510639	A	20000222		
EP 1005735	B1	20050518	EP 1998945070	A	19980729	200538	E
			WO 1998DE2172	A	19980729		

Priority Applications (no., kind, date): DE 19736653 A 19970822

Patent Details

Patent Number	Kind	Lan	Pgs	Draw	Filing Notes	
DE 19736653	C1	DE	11	11		
WO 1999011013	A1	DE				
National Designated States,Original	AU BR CA CN HU ID IL JP KR MX NO PL RU UA US VN					
Regional Designated States,Original	AT BE CH CY DE DK EA ES FI FR GB GR IE IT LU MC NL PT SE					
AU 199892534	A	EN			Based on OPI patent	WO 1999011013
EP 1005735	A1	DE			PCT Application	WO 1998DE2172

					Based on OPI patent	WO 1999011013
Regional Designated States,Original	DE FI FR GB SE					
BR 199811918	A	PT			PCT Application	WO 1998DE2172
					Based on OPI patent	WO 1999011013
JP 2001514459	W	JA	33		PCT Application	WO 1998DE2172
					Based on OPI patent	WO 1999011013
RU 2202153	C2	RU			PCT Application	WO 1998DE2172
					Based on OPI patent	WO 1999011013
US 6629286	B1	EN			Continuation of application	WO 1998DE2172
EP 1005735	B1	DE			PCT Application	WO 1998DE2172
					Based on OPI patent	WO 1999011013
Regional Designated States,Original	FI FR GB SE					

### Alerting Abstract DE C1

The method involves estimating the service quality on the transmission channels in a digital transmission system, in which a turbo-encoding is performed for a channel encoding in a turbo-encoder at the transmitter side. A turbo-decoding, with soft-decision output signals, is performed in a turbo-decoder at the receiver side.

The service quality is determined from the variance of the soft-decision output signals at the receiver side, preferably through a soft-input/soft-output symbol or sequence estimator, by using a detected bit error rate.

USE - In mobile and base station of mobile communications network.

ADVANTAGE - Enables estimation of service quality without additional effort.

ADVANTAGE - .

**Title Terms /Index Terms/Additional Words:** SERVICE; QUALITY; ESTIMATE; METHOD; CHANNEL; DIGITAL; TRANSMISSION; SYSTEM; DETERMINE; VARIANCE; SOFT; DECIDE; OUTPUT; SIGNAL; TURBO; DECODE; RECEIVE; SIDE

### Class Codes

#### International Patent Classification

IPC	Class Level	Scope	Position	Status	Version Date
H04L-001/20			Main		"Version 7"
H03M-0013/13	A	I	F	R	20060101
H03M-0013/29	A	I		R	20060101
H03M-0013/35	A	I		R	20060101
H03M-0013/41	A	I	L	R	20060101
H03M-0013/45	A	I	L	R	20060101
H04L-0001/00	A	I		R	20060101
H04L-0001/20	A	I		R	20060101
H03M-0013/00	C	I		R	20060101
H04L-0001/00	C	I		R	20060101
H04L-0001/20	C	I		R	20060101

**ECLA:** H03M-013/29T, H03M-013/29T3, H03M-013/29T5, H03M-013/35, H04L-001/00B5E5, H04L-001/00B5T, H04L-001/00B7K3, H04L-001/00B7R1, H04L-001/20

**ICO:** T04L-001:00B7K3, T04L-001:00B7P

**US Classification, Issued:** 714755, 714786

File Segment: EPI;

DWPI Class: U21; W01; W02

Manual Codes (EPI/S-X): U21-A06; W01-A01B; W01-A01C; W01-A02; W01-A06A; W01-B05A1A; W01-C01D3; W02-C03C1B; W02-C03C1C; W02-G03J5

## **Original Publication Data by Authority**

### **Australia**

**Publication No.** AU 199892534 A (Update 199930 E)

Publication Date: 19990316

Assignee: SIEMENS AG; DE (SIEI)

Language: EN

Application: AU 199892534 A 19980729 (Local application)

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Related Publication: WO 1999011013 A (Based on OPI patent )

Original IPC: H04L-1/20(A)

Current IPC: H03M-13/00(R,A,I,M,EP,20060101,20051008,C) H03M-

13/13(R,I,M,JP,20060101,20051220,A,F) H03M-13/29(R,I,M,EP,20060101,20051008,A) H03M-

13/35(R,I,M,EP,20060101,20060722,A) H03M-13/41(R,I,M,JP,20060101,20051220,A,L) H03M-

13/45(R,I,M,JP,20060101,20051220,A,L) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-

1/00(R,I,M,EP,20060101,20051008,C) H04L-1/20(R,I,M,EP,20060101,20051008,A) H04L-

1/20(R,I,M,EP,20060101,20051008,C)

Current ECLA class: H03M-13/29T H03M-13/29T3 H03M-13/29T5 H03M-13/35 H04L-1/00B5E5

H04L-1/00B7K3 H04L-1/00B7R1 H04L-1/20

### **Brazil**

**Publication No.** BR 199811918 A (Update 200045 E)

Publication Date: 20000815

Assignee: SIEMENS AG (SIEI)

Inventor: DOETSCH M

PLECHINGER J

JUNG P

BERENS T

Language: PT

Application: BR 199811918 A 19980729 (Local application)

WO 1998DE2172 A 19980729 (PCT Application)  
Priority: DE 19736653 A 19970822  
Related Publication: WO 1999011013 A (Based on OPI patent )  
Original IPC: H04L-1/20(A)  
Current IPC: H03M-13/00(R,A,I,M,EP,20060101,20051008,C) H03M-13/13(R,I,M,JP,20060101,20051220,A,F) H03M-13/29(R,I,M,EP,20060101,20051008,A) H03M-13/35(R,I,M,EP,20060101,20060722,A) H03M-13/41(R,I,M,JP,20060101,20051220,A,L) H03M-13/45(R,I,M,JP,20060101,20051220,A,L) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/20(R,I,M,EP,20060101,20051008,A) H04L-1/20(R,I,M,EP,20060101,20051008,C)  
Current ECLA class: H03M-13/29T H03M-13/29T3 H03M-13/29T5 H03M-13/35 H04L-1/00B5E5 H04L-1/00B7K3 H04L-1/00B7R1 H04L-1/20

## China

**Publication No.** CN 1268268 A (Update 200067 E)  
**Publication Date:** 20000927  
**Assignee:** SIEMENS AG; DE (SIEI)  
**Language:** ZH  
**Application:** CN 1998808414 A 19980729 (Local application)  
**Priority:** DE 19736653 A 19970822  
**Original IPC:** H04L-1/20(A)  
**Current IPC:** H03M-13/00(R,A,I,M,EP,20060101,20051008,C) H03M-13/13(R,I,M,JP,20060101,20051220,A,F) H03M-13/29(R,I,M,EP,20060101,20051008,A) H03M-13/35(R,I,M,EP,20060101,20060722,A) H03M-13/41(R,I,M,JP,20060101,20051220,A,L) H03M-13/45(R,I,M,JP,20060101,20051220,A,L) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/20(R,I,M,EP,20060101,20051008,A) H04L-1/20(R,I,M,EP,20060101,20051008,C)  
**Current ECLA class:** H03M-13/29T H03M-13/29T3 H03M-13/29T5 H03M-13/35 H04L-1/00B5E5 H04L-1/00B7K3 H04L-1/00B7R1 H04L-1/20

## Germany

**Publication No.** DE 19736653 C1 (Update 199902 B)  
**Publication Date:** 19981210  
**Verfahren und Einrichtung zur Abschaetzung der Dienstqualitaet auf Uebertragungskanaelen in einem digitalen Uebertragungssystem**  
**Assignee:** Siemens AG, 80333 Muenchen, DE (SIEI)  
**Inventor:** Doetsch, Markus, Dipl.-Ing., 56072 Koblenz, DE  
Plechinger, Joerg, Dipl.-Ing., 67663 Kaiserslautern, DE  
Jung, Peter, Dr.-Ing. habil, 67697 Otterberg, DE  
**Language:** DE (11 pages, 11 drawings)  
**Application:** DE 19736653 A 19970822 (Local application)  
**Original IPC:** H04L-1/24(A) H03M-13/00(B) H04L-12/26(B)  
**Current IPC:** H03M-13/00(R,A,I,M,EP,20060101,20051008,C) H03M-13/13(R,I,M,JP,20060101,20051220,A,F) H03M-13/29(R,I,M,EP,20060101,20051008,A) H03M-

13/35(R,I,M,EP,20060101,20060722,A) H03M-13/41(R,I,M,JP,20060101,20051220,A,L) H03M-13/45(R,I,M,JP,20060101,20051220,A,L) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/20(R,I,M,EP,20060101,20051008,A) H04L-1/20(R,I,M,EP,20060101,20051008,C)

Current ECLA class: H03M-13/29T H03M-13/29T3 H03M-13/29T5 H03M-13/35 H04L-1/00B5E5 H04L-1/00B7K3 H04L-1/00B7R1 H04L-1/20

Claim:

- 1. Verfahren zur Abschätzung der Dienstqualität auf Übertragungskanalen in einem digitalen Übertragungssystem, bei dem zur Kanalcodierung senderseitig in einem Turbo-Codierer eine Turbo-Codierung und empfängerseitig in einem Turbo-Decodierer eine Turbo-Decodierung mit Soft-Decision-Ausgangssignalen durchgeführt wird, **dadurch gekennzeichnet**, dass die Dienstqualität aus den Varianzen der Soft-Decision-Ausgangssignale an dem Turbo-Decodierer bestimmt wird.

## EPO

**Publication No.** EP 1005735 A1 (Update 200032 E)

Publication Date: 20000607

**VERFAHREN UND EINRICHTUNG ZUR ABSCHATZUNG DER DIENSTQUALITÄT AUF ÜBERTRAGUNGSKANALEN IN EINEM DIGITALEN ÜBERTRAGUNGSSYSTEM**

**METHOD AND DEVICE FOR ASSESSING THE SERVICE QUALITY OF TRANSMISSION CHANNELS IN A DIGITAL TRANSMISSION SYSTEM**

**PROCEDE ET DISPOSITIF POUR L'EVALUATION DE LA QUALITE DE SERVICE SUR DES CANAUX DE TRANSMISSION DANS UN SYSTEME DE TRANSMISSION NUMERIQUE**

Assignee: SIEMENS AKTIENGESELLSCHAFT, Wittelsbacherplatz 2, 80333 München, DE (SIEI)

Inventor: DOETSCH, Markus, Sendnicher Weg 62, D-56072 Koblenz, DE

PLECHINGER, Jorg, Westermühlstrasse 16, D-80469 München, DE

JUNG, Peter, Im Rabental 28, D-67697 Otterberg, DE

BERENS, Friedbert, Keltenweg 67, D-67663 Kaiserslautern, DE

Language: DE

Application: EP 1998945070 A 19980729 (Local application)

WO 1998DE2172 A 19980729 (PCT Application)

Priority: DE 19736653 A 19970822

Related Publication: WO 1999011013 A (Based on OPI patent )

Designated States: (Regional Original) DE FI FR GB SE

Original IPC: H04L-1/20(A)

Current IPC: H03M-13/00(R,A,I,M,EP,20060101,20051008,C) H03M-

13/13(R,I,M,JP,20060101,20051220,A,F) H03M-13/29(R,I,M,EP,20060101,20051008,A) H03M-

13/35(R,I,M,EP,20060101,20060722,A) H03M-13/41(R,I,M,JP,20060101,20051220,A,L) H03M-

13/45(R,I,M,JP,20060101,20051220,A,L) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-

1/00(R,I,M,EP,20060101,20051008,C) H04L-1/20(R,I,M,EP,20060101,20051008,A) H04L-

1/20(R,I,M,EP,20060101,20051008,C)

Current ECLA class: H03M-13/29T H03M-13/29T3 H03M-13/29T5 H03M-13/35 H04L-1/00B5E5

H04L-1/00B7K3 H04L-1/00B7R1 H04L-1/20

Original Abstract: The invention relates to a method and a device for assessing the service quality of transmission channels in a digital transmission system, wherein turbo-coding for channel coding is carried out in a turbo-coder on the sender side and turbo decoding is performed using a turbo-decoder with soft decision output signals on the receiver side. Service quality is determined on the basis of variances in the soft decision output signals in the turbo-decoder. When a MAP symbol evaluator is used in the receiver side, the service quality is determined on the basis of the variances  $\sigma^2_{LLR}$  of the soft decision output signals of the turbo-decoder. The bit error rate is calculated on the basis of the variances  $\sigma^2_{LLR}$  to measure service quality. An RCPTC is used as turbo-code in the method and in the device.

**Publication No.** EP 1005735 B1 (Update 200538 E)

Publication Date: 20050518

**VERFAHREN UND EINRICHTUNG ZUR ABSCHATZUNG DER DIENSTQUALITÄT AUF  
UBERTRAGUNGSKANALEN IN EINEM DIGITALEN UBERTRAGUNGSSYSTEM  
METHOD AND DEVICE FOR ASSESSING THE SERVICE QUALITY OF  
TRANSMISSION CHANNELS IN A DIGITAL TRANSMISSION SYSTEM  
PROCEDE ET DISPOSITIF POUR L'EVALUATION DE LA QUALITE DE SERVICE SUR  
DES CANAUX DE TRANSMISSION DANS UN SYSTEME DE TRANSMISSION  
NUMERIQUE**

Assignee: SIEMENS AKTIENGESELLSCHAFT, Wittelsbacherplatz 2, 80333 Munchen, DE (SIEI)

Inventor: DOETSCH, Markus, Sendnicher Weg 62, D-56072 Koblenz, DE

PLECHINGER, Jorg, Westermuhlstrasse 16, D-80469 Munchen, DE

JUNG, Peter, Im Rabental 28, D-67697 Otterberg, DE

BERENS, Friedbert, Keltenweg 67, D-67663 Kaiserslautern, DE

Language: DE

Application: EP 1998945070 A 19980729 (Local application)

WO 1998DE2172 A 19980729 (PCT Application)

Priority: DE 19736653 A 19970822

Related Publication: WO 1999011013 A (Based on OPI patent )

Designated States: (Regional Original) FI FR GB SE

Original IPC: H04L-1/20(A)

Current IPC: H03M-13/00(R,A,I,M,EP,20060101,20051008,C) H03M-

13/13(R,I,M,JP,20060101,20051220,A,F) H03M-13/29(R,I,M,EP,20060101,20051008,A) H03M-

13/35(R,I,M,EP,20060101,20060722,A) H03M-13/41(R,I,M,JP,20060101,20051220,A,L) H03M-

13/45(R,I,M,JP,20060101,20051220,A,L) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-

1/00(R,I,M,EP,20060101,20051008,C) H04L-1/20(R,I,M,EP,20060101,20051008,A) H04L-

1/20(R,I,M,EP,20060101,20051008,C)

Current ECLA class: H03M-13/29T H03M-13/29T3 H03M-13/29T5 H03M-13/35 H04L-1/00B5E5

H04L-1/00B7K3 H04L-1/00B7R1 H04L-1/20

Claim:

1. Verfahren zur Abschätzung der Dienstqualität auf Übertragungskanalen in einem digitalen Übertragungssystem, bei dem zur Kanalcodierung senderseitig in einem Turbo-Codierer eine Turbo-Codierung und empfängerseitig in einem Turbo-Decodierer eine Turbo-Decodierung mit Soft-Decision-Ausgangssignalen durchgeführt wird, **dadurch gekennzeichnet, dass** die Dienstqualität aus den Momentanwerten der Varianzen der Soft-Decision-Ausgangssignale an dem Turbo-Decodierer bestimmt wird.

1. Method for estimating the quality of service on transmission channels in a digital transmission system, in which for channel coding, turbo coding is undertaken with a turbo coder on the sender side and turbo decoding is undertaken in a turbo decoder on the receiver side with soft-decision output signals,  
**characterized in that** the quality of service is determined from the instantaneous values of the variances of the soft-decision output signals at the turbo decoder.
  
1. Procédé pour l'évaluation de la qualité de service sur des canaux de transmission dans un système de transmission numérique, avec lequel on effectue un turbo-codage pour le codage de canal côté émetteur dans un turbo-codeur et un turbo-décodage côté récepteur dans un turbo-décodeur avec des signaux de sortie Soft-Decision, **caractérisé en ce que** la qualité de service est déterminée à partir des valeurs instantanées des variances des signaux de sortie Soft-Decision sur le turbo-décodeur.

## Japan

**Publication No.** JP 2001514459 W (Update 200167 E)

Publication Date: 20010911

Language: JA (33 pages)

Application: WO 1998DE2172 A 19980729 (PCT Application)

JP 2000508160 A 19980729 (Local application)

Priority: DE 19736653 A 19970822

Related Publication: WO 1999011013 A (Based on OPI patent )

Original IPC: H04L-1/20(A) H03M-13/13(B) H03M-13/29(B) H03M-13/41(B) H03M-13/45(B)

Current IPC: H04L-1/20(A) H03M-13/13(B) H03M-13/29(B) H03M-13/41(B) H03M-13/45(B)

Current ECLA class: H03M-13/29T H03M-13/29T3 H03M-13/29T5 H03M-13/35 H04L-1/00B5E5  
H04L-1/00B7K3 H04L-1/00B7R1 H04L-1/20

## Korea

**Publication No.** KR 2001023205 A (Update 200161 E)

Publication Date: 20010326

Assignee: SIEMENS AG (SIEI)

Language: KO

Application: KR 2000701834 A 20000222 (Local application)

Priority: DE 19736653 A 19970822

Original IPC: H04L-1/20(A)

Current IPC: H04L-1/20(A)

## Russia

**Publication No.** RU 2202153 C2 (Update 200338 E)

Publication Date: 20030410

Assignee: SIEMENS AG; DE (SIEI)

Language: RU

Application: WO 1998DE2172 A 19980729 (PCT Application)

RU 2000107150 A 19980729 (Local application)

Priority: DE 19736653 A 19970822

Related Publication: WO 1999011013 A (Based on OPI patent )

Original IPC: H04L-1/20(A)

Current IPC: H03M-13/00(R,A,I,M,EP,20060101,20051008,C) H03M-13/13(R,I,M,JP,20060101,20051220,A,F) H03M-13/29(R,I,M,EP,20060101,20051008,A) H03M-13/35(R,I,M,EP,20060101,20060722,A) H03M-13/41(R,I,M,JP,20060101,20051220,A,L) H03M-13/45(R,I,M,JP,20060101,20051220,A,L) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/20(R,I,M,EP,20060101,20051008,A) H04L-1/20(R,I,M,EP,20060101,20051008,C)

Current ECLA class: H03M-13/29T H03M-13/29T3 H03M-13/29T5 H03M-13/35 H04L-1/00B5E5 H04L-1/00B7K3 H04L-1/00B7R1 H04L-1/20

## United States

**Publication No.** US 6629286 B1 (Update 200367 E)

Publication Date: 20030930

**Method and device for assessing the quality of service on transmission channels in a digital transmission system**

Assignee: Siemens Aktiengesellschaft, Munich, DE (SIEI)

Inventor: Berens, Friedbert, Geneva, CH

Doetsch, Markus, Munchen, DE

Plechinger, Jorg, Munchen, DE

Jung, Peter, Otterberg, DE

Agent: Greenberg, Laurence A., US

Stemer, Werner H., US

Mayback, Gregory L., US

Language: EN

Application: WO 1998DE2172 A 19980729 (Continuation of application)

US 2000510639 A 20000222 (Local application)

Priority: DE 19736653 A 19970822

Original IPC: H03M-13/29(A) H04L-1/00(B)

Current IPC: H03M-13/00(R,A,I,M,EP,20060101,20051008,C) H03M-13/13(R,I,M,JP,20060101,20051220,A,F) H03M-13/29(R,I,M,EP,20060101,20051008,A) H03M-13/35(R,I,M,EP,20060101,20060722,A) H03M-13/41(R,I,M,JP,20060101,20051220,A,L) H03M-13/45(R,I,M,JP,20060101,20051220,A,L) H04L-1/00(R,I,M,EP,20060101,20051008,A) H04L-1/00(R,I,M,EP,20060101,20051008,C) H04L-1/20(R,I,M,EP,20060101,20051008,A) H04L-1/20(R,I,M,EP,20060101,20051008,C)

Current ECLA class: H03M-13/29T H03M-13/29T3 H03M-13/29T5 H03M-13/35 H04L-1/00B5E5 H04L-1/00B7K3 H04L-1/00B7R1 H04L-1/20



Original US Class (main): 714755

Original US Class (secondary): 714786

Original Abstract: A quality of service on transmission channels in a digital transmission system is assessed. A turbo coding is carried out in a turbo coder at the transmitter end for channel coding. A turbo decoding is carried out in a turbo decoder with soft-decision output signals at the receiver end. The quality of service is determined from the variances of the soft-decision output signals from the turbo decoder. If a MAP (maximum a posteriori) symbol estimator is used at the receiver end, the quality of service is determined from the variance  $\sigma^2_{LLR}$  of the log-likelihood ratio LLR of the soft-decision output signals from the turbo decoder. The variances  $\sigma^2_{LLR}$  are used to calculate the bit error rate as a measure of the quality of service. An RCPTC (Rate Compatible Punctured Turbo Code) is used as the turbo code for the method and in the device for assessing the quality of service.

Claim: We claim:

1. 1. A method for assessing a quality of service on transmission channels in a digital transmission system, the method which comprises:
  - performing a turbo coding in a turbo coder for a channel coding at a transmitter end;
  - performing a turbo decoding in a turbo decoder with soft-decision output signals at a receiver end; and
  - determining a quality of service from instantaneous values of variances of the soft-decision output signals from the turbo decoder.

## WIPO

**Publication No.** WO 1999011013 A1 (Update 199916 E)

Publication Date: 19990304

**VERFAHREN UND EINRICHTUNG ZUR ABSCHATZUNG DER DIENSTQUALITAT AUF  
UBERTRAGUNGSKANALEN IN EINEM DIGITALEN UBERTRAGUNGSSYSTEM  
METHOD AND DEVICE FOR ASSESSING THE SERVICE QUALITY OF  
TRANSMISSION CHANNELS IN A DIGITAL TRANSMISSION SYSTEM  
PROCEDE ET DISPOSITIF POUR L'EVALUATION DE LA QUALITE DE SERVICE SUR  
DES CANAUX DE TRANSMISSION DANS UN SYSTEME DE TRANSMISSION  
NUMERIQUE**

Assignee: (*except US*) SIEMENS AKTIENGESELLSCHAFT, Wittelsbacherplatz 2, D-80333

Munchen, DE Residence: DE Nationality: DE (SIEI)

(*only US*) DOETSCH, Markus, Sendnicher Weg 62, D-56072 Koblenz, DE Residence: DE

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Original Abstract: Bei einem Verfahren und einer Einrichtung zur Abschätzung der Dienstqualität auf Übertragungskanal in einem digitalen Übertragungssystem wird zur Kanalcodierung senderseitig in einem Turbo-Codierer eine Turbo-Codierung und empfängerseitig in einem Turbo-Decodierer eine Turbo-Decodierung mit Soft-Decision-Ausgangssignalen durchgeführt. Die Dienstqualität wird aus den Varianzen der Soft-Decision-Ausgangssignale an dem Turbo-Decodierer bestimmt. Wenn empfängerseitig ein MAP-Symbolschatzer verwendet wird, wird die Dienstqualität aus den Varianzen  $\sigma^2_{LLR}$  der Soft-Decision-Ausgangssignale des Turbo-Decodierers bestimmt, indem aus den Varianzen  $\sigma^2_{LLR}$  die Bitfehlerrate als Mass für die Dienstqualität berechnet wird. Bei dem Verfahren und in der Einrichtung wird als Turbo-Code ein RCPTC verwendet.

The invention relates to a method and a device for assessing the service quality of transmission channels in a digital transmission system, wherein turbo-coding for channel coding is carried out in a turbo-coder on the sender side and turbo decoding is performed using a turbo-decoder with soft decision output signals on the receiver side. Service quality is determined on the basis of variances in the soft decision output signals in the turbo-decoder. When a MAP symbol evaluator is used in the receiver side, the service quality is determined on the basis of the variances  $\sigma^2_{LLR}$  of the soft decision output signals of the turbo-decoder. The bit error rate is calculated on the basis of the variances  $\sigma^2_{LLR}$  to measure service quality. An RCPTC is used as turbo-code in the method and in the device.

L'invention concerne un procede et un dispositif pour evaluer la qualite de service sur des canaux de transmission dans un systeme de transmission numerique. Pour le codage des canaux, un turbo-codage s'effectue cote emetteur dans un turbo-codeur, et un turbo-decodage s'effectue cote recepteur dans un turbo-decodeur avec des signaux de sortie de decision ponderee. La qualite de service est determinee a partir des variances des signaux de sortie de decision ponderee au niveau du turbo-decodeur. Lorsqu'un evaluateur de symboles MAP est utilise cote recepteur, la qualite de service est determinee a partir des variances  $\sigma^2_{LLR}$  des signaux de sortie de decision ponderee du turbo-decodeur, le taux d'erreurs sur les bits etant calcule a partir de celles-ci et permettant de mesurer la qualite de service. Dans ce procede et ce dispositif, un RCPTC est utilise comme turbo-code.